

## CLAIMS

1. A microdevice for electrophoresis of biomolecule-containing samples, comprising:  
a substrate;  
an elongate electroseparation channel formed in said substrate;  
a sample-loading region formed in said substrate, with the sample-loading region being disposed for fluid communication with said electroseparation channel; and  
a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information.
2. The microdevice of claim 1, wherein said sample-loading region comprises a reservoir formed in said substrate, with the reservoir being disposed for fluid communication with said electroseparation channel.
3. The microdevice of claim 1, wherein said sample-loading region comprises an injection channel formed in said substrate, with the injection channel being disposed for fluid communication with said electroseparation channel.
4. The microdevice of claim 1, further comprising:  
one or more electrodes, and a power source; with said one or more electrodes being connectable to said power source, and disposed with respect to said electroseparation channel for generating an electrical field along at least a portion thereof.

5. The microdevice of claim 1, wherein said electroseparation channel includes a cross-sectional dimension of no greater than 500 micrometers.
6. The microdevice of claim 1, wherein said substrate comprises a plate, wafer, chip, slide, or disc.
7. The microdevice of claim 1, wherein the memory is removably attached to the substrate.
8. The microdevice of claim 1, wherein the memory is permanently affixed to the substrate.
9. The device of claim 1, wherein the memory is selected from the group consisting of integrated circuit memories, optical memories, thin film semiconductor memories, ferromagnetic memories, molecular memories, biomolecular memories, and any combination thereof.
10. The microdevice of claim 1, further comprising a microcontroller chip supported by said substrate and adapted for communication with said memory.
11. The microdevice of claim 1, further comprising machine-readable computer code stored in said memory.
12. The microdevice of claim 1, wherein said memory includes a storage capacity of at least 1 megabyte.

13. A microdevice for manipulation of analyte-containing samples, comprising:
- a substrate;
  - an injection channel and a separation channel formed in said substrate, with said channels intersecting one another;
  - a reservoir disposed for fluid communication with one of said ends of said injection channel; and
  - a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information.
14. The microdevice of claim 13, further comprising:
- one or more electrodes, and a power source; with said one or more electrodes being connectable to said power source, and disposed with respect to said channels for generating one or more electrical fields along at least a portion thereof.
15. The microdevice of claim 13, wherein at least one of said channels includes a cross-sectional dimension of no greater than 500 micrometers.
16. The microdevice of claim 13, wherein said substrate comprises a plate, wafer, chip, slide, or disc.
17. The microdevice of claim 13, wherein the memory is removably attached to the substrate.

18. The microdevice of claim 13, wherein the memory is permanently affixed to the substrate.
19. The device of claim 13, wherein the memory is selected from the group consisting of integrated circuit memories, optical memories, thin film semiconductor memories, ferromagnetic memories, molecular memories, biomolecular memories, and any combination thereof.
20. The microdevice of claim 13, further comprising a microcontroller chip supported by said substrate and adapted for communication with said memory.
21. The microdevice of claim 13, further comprising machine-readable computer code stored in said memory.
22. The microdevice of claim 13, wherein said memory includes a storage capacity of at least 1 megabyte.
23. A device for manipulating one or more biomolecule-containing samples, comprising:  
a substrate;  
a plurality of elongate separation channels formed in said substrate;  
one or more sample-loading regions formed in said substrate, with at least one of said one or more sample-loading regions being disposed for fluid communication with one or more of said separation channels; and

a rewritable memory integrated into said substrate, with said memory being adapted for storing binary coded information.

24. The device of claim 23, further comprising:

one or more electrodes, and a power source; with said one or more electrodes being connectable to said power source, and disposed with respect to at least one of said separation channels for generating one or more electrical fields along at least a portion thereof.

25. The device of claim 23, wherein said separation channels are non-intersecting.

26. The device of claim 23, wherein said substrate comprises a plate, wafer, chip, slide, or disc.

27. The microdevice of claim 23, wherein the memory is permanently affixed to the substrate.

28. The device of claim 23, wherein the memory is selected from the group consisting of integrated circuit memories, optical memories, thin film semiconductor memories, ferromagnetic memories, molecular memories, biomolecular memories, and any combination thereof.

29. The microdevice of claim 23, wherein said memory includes a storage capacity of at least 1 megabyte.